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***Central Eurasia:
Life Sciences***

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Enhancement of Heat Shock Tolerance in Wheat Seedlings by Kartolin-2

937C02164 Moscow DOKLADY ROSSIYSKOY
AKADEMII SELSKOKHOZYAYSTVENNYKH NAUK
in Russian No 1, Jan-Feb 93 (manuscript received
4 Sep 92) pp 9-12

[Article by M. Sarvat, V. V. Kuznetsov and O. N. Kulayeva, Biochemistry Department, Cairo University; Institute of Plant Physiology imeni K. A. Timiryazev, Russian Academy of Sciences; UDC 633.11:631.53.02.3]

[Abstract] Heat-susceptible Opal-69 wheat was used in assessing the impact of seed and seedling treatment with kartolin-2 (K2) on responsiveness of 72 hour seedlings to heat shock (45°C for one hour). The results showed that optimum benefit from K2 was derived by pretreatment of the seeds with 10E-5 M K2 solution, which included a growth spurt in 40 percent of the unshocked and 60 percent of the shocked seedlings over the next 2-3 days. In addition, K2 also increased the three-day survival rate to 60 percent (vs. 100 percent mortality after three days for control seedlings), which was accompanied by a 50-70 percent rise in leaf chlorophyll levels. Figures 2, references 9; Russian.

In Vitro Haploidy Method for Creation of Novel Spring Wheat Lines

937C0216B Moscow DOKLADY ROSSIYSKOY
AKADEMIY SELSKOKHOZYAYSTVENNYYKH NAUK
in Russian No 1, Jan-Feb 93 (manuscript received
12 Feb 92) pp 12-15

[Article by V. A. Vnuchkova and A. V. Anashechenko, All-Russian Scientific Research Institute of Agricultural Biotechnology, UDC 633.11+321.7:631.527]

[Abstract] In vitro cultivation of anthers obtained from first hybrid generations of multiple spring wheat crossings of high quality cultivars yielded homozygotic cultivars exceeding parental forms in grain yield and flour quality. Doubling of the chromosome number before planting was attained by incubation of the regenerant plants for five hours in 0.3 percent colchicine with 0.03 percent papain at 23°C. The time required for the development of the new androgenic cultivars using the in vitro haploidy approach was four years, versus considerably longer periods required with conventional breeding techniques. References 5: 3 Russian, 1 Chinese, 1 Western.

Expression of Bovine Somatotropin Gene in Transgenic Rabbits Bearing mMT1/bGHatt-Matrix Attachment Region Construct

937C0216D Moscow DOKLADY ROSSIYSKOY
AKADEMIY SELSKOKHOZYAYSTVENNYYKH NAUK
in Russian No 1, Jan-Feb 93 (manuscript received
16 Sep 92) pp 58-72

[Article by I. I. Goldman, acad. Russ. Acad. Agricult., I. K. Ernst, P. A. Gogolevskiy, V. M. Afanasyeva, V. A. Semenova, M. A. Grashchuk, M. A. Kononov, P. M. Klenovitskiy, I. K. Zhelev, I. A. Polezhayeva, M. M. Mitulipova, A. B. Zhadanov, A. V. Kuznetsov, G. A. Dvoryanchikov and I. K. Dubovaya, All-Russian Scientific Research Institute of Animal Husbandry, Institute of Molecular Biology, Russian Academy of Sciences; Institute of Applied Microbiology, All-Russian Scientific Research Institute of Physiology, Biochemistry and Nutrition of Farm Animals, 2d Moscow Medical Institute, UDC 636.92:636.082.12]

[Abstract] Transgenic chinchilla rabbits were derived by injection of the male pronucleus with recombinant DNA incorporating the bovine growth hormone (bGH) gene (mMT1-bGH) linked at its 5'-end to a matrix attachment region (1719 kbp DNA fragment of the 5'-flanking region of chicken α -globin). One transgenic rabbit bearing three copies of the mMT1-bGHatt construct with bGH levels of 55 ng/ml presented with acromegaly on the basis of physical examination and laboratory studies. In addition, dietary zinc sulfate supplements led to a further 3.6-fold elevation in blood bGH. Immunoassays also revealed multi-organ (kidneys, heart, lungs, liver, pituitary) bGH synthesis, as well as bGH production by tissues cultures derived from these organs. Cytogenetic studies revealed the circulation of two lymphocyte

clones, one with a normal diploid chromosome number ($2n = 44$) and the other (65 percent) with 48 chromosomes containing an extra small submetacentric chromosome. An analogous aberrant clone (40 percent) was noted in examination of skin fibroblasts. Figures 9; references 28: 15 Russian, 13 Western.

Growth Characteristics of Bovine Leukemia Virus-Infected TEC-MVA-76 Cell Culture in Athymic Mice

937C0216E Moscow DOKLADY ROSSIYSKOY
AKADEMIY SELSKOKHOZYAYSTVENNYYKH NAUK
in Russian No 1, Jan-Feb 93 (manuscript received
31 Jul 91) pp 72-76

[Article by G. V. Kudeleva, V. A. Krikun, I. I. Nagayeva, V. O. Ose, M. A. Glazeva, S. I. Ivanova, I. G. Chernobayeva, V. V. Konycheva, R. A. Kukain, academician, Latvian Acad. Sci., and V. P. Shishkov, academician, Russ. Acad. Agricult., Institute of Microbiology, Latvian Academy of Sciences, Moscow Veterinary Academy, imeni K. I. Skryabin, UDC 599.323.4:57.086.865+578.828.11]

[Abstract] Inoculation of continuous TEC-MVA-76 cell culture infected with bovine leukemia virus (BLV) into athymic 10- to 45-day-old BALB/c nu/nu mice resulted in the establishment of a viable xenograft. The xenograft latent times decreased on re-inoculation from 20 to 5-10 days, depending on inoculum size and animal age. The cells retained infectivity with BLV as shown by production of p24 and gp51 antigens and appearance of C-type particles on in vitro reculture. These findings demonstrated the utility of athymic mice for in vivo maintenance of the TEC-MVA-76 cells without morphological alterations or loss of BLV. Figures 3; references 8: 3 Russian, 5 Western.

cDNA of Foot-and-Mouth Disease Virus (FMDV) A₂₂ Genome

937C0216F Moscow DOKLADY ROSSIYSKOY
AKADEMIY SELSKOKHOZYAYSTVENNYYKH NAUK
in Russian No 1, Jan-Feb 93 (manuscript received
20 May 92) pp 77-81

[Article by A. G. Ammev, V. V. Drugin, A. V. Shcherbakov, N. A. Perevozchikova, V. N. Ivanushchenkov (dec.) and A. N. Burdov, All-Russian Scientific Research Institute of Animal Protection, UDC 578.5]

[Abstract] Conventional techniques were used to construct cDNA representing the FMDV A₂₂ genome. The cDNA construct consisted of an approximately 7000-kbp fragment corresponding to 90 percent of the entire viral genome. Transcription with the cDNA construct and translation studies with the resultant RNA transcripts yielded FMDV proteins indistinguishable from those obtained by translation of the viral genome. Figures 4; references 10: 2 Russian, 8 Western.

Concentration Dynamics of Petroleum Products, Phenols, and SAS in Water of Dnipro River

937C02121 Minsk VESTNI AKADEMII NAUK BSSR, SERIYA BIOL. I KHIMICHESKIH NAUK in Russian No 6, Nov-Dec 91 (manuscript received 25 Jan 91) p 127

[Abstract of an article in Belarusian on pp 90-94 by A.N. Lyakh, Institute of Zoology, BSSR Academy of Sciences; UDC 591.5+502.55:628.39(282.247.32)]

[Text] Concentration dynamics of petroleum products, phenols and surface active substances (SAS) in the Dnipro river was investigated during several years. The determinations were carried out in the region of Orsha, Mogilev and Rechitsa townships above and below the population points. It was shown that the water content of petroleum products and phenols exceeded the maximum permissible concentration. In respect to petroleum products, the most contaminated river segment was in the vicinity of Orsha. The phenol content in water was higher downstream from Orsha and Mogilev. It was noted that during the past years the concentration of SAS in the Dnipro river water increased in the vicinity of Orsha and Mogilev. Figure 1, references 9.

Radionuclide Distribution in Lupine and Clover Leaf and Stem Proteins

937C02166 Moscow DOKLADY ROSSIYSKOY AKADEMII SELSKOKHOZYAYSTVENNYKH NAUK in Russian No 1, Jan Feb 92 (manuscript received 16 Feb 92) p 41-47

[Article by Yu. F. Novikov, G. A. Lobach, T. A. Buzenko and T. P. Zaretskaya, Central Scientific Research Laboratory for Processing Plant Raw Materials and Byproducts of the Agricultural Industry; UDC 636.085.13:632.118.3]

[Abstract] An assessment was made of the distribution of Cs-134 + Cs-137 and Sr-90 in protein fractions derived from leaf and stems of lupine and clover collected in the vicinity of the village of Kopachi, Ukraine, located in the 10-km radius of Chernobyl. Recovery of protein-vitamin and cytoplasmic protein concentrates showed considerable differences between lupine and clover. In the case of the cytoplasmic isolate the specific radioactivities of the dry products from lupine and clover were equivalent (3.76×10^{-8} Ci/kg Cs-134 + Cs-137; 4.74×10^{-8} Ci/kg Sr-90). However, the specific radioactivities of the dry protein-vitamin complex were lower in clover (18.79×10^{-8} Ci/kg Cs-134 + Cs-137; 10.36×10^{-8} Ci/kg Sr-90) than in lupine in view of the lower rate of radionuclide transfer from cell juice to protein fraction in the former. Testing also demonstrated that the radionuclide levels in the protein fractions can be reduced 4- to 5-fold by appropriate heat treatment and washing procedures. Figures 2; references 5- Russian.

Russian Scientists' Open Letter to Caspian States on Endangered Fisheries

937C0228 Moscow ROSSIYSKIYE VESTNI in Russian No 7, Apr 93 p 3

[Open letter by Prof. I. A. Baranukova, doctor of biological sciences, V. K. Vinogradov, doctor of biological sciences, M. Ye. Vinogradov, academician, Russian Academy of Sciences, A. D. Vlasenko, candidate of biological sciences, O. V. Gritsenko, doctor of biological sciences, A. A. Yelizarov, doctor of geographical sciences, K. A. Zemskaya, candidate of biological sciences, Prof. V. K. Zil'nov, candidate of biological sciences, A. P. Ivanov, candidate of biological sciences, Prof. B. N. Kazanskii, doctor of biological sciences, L. A. Kader'skiy, doctor of biological sciences, B. N. Kotelnik, candidate of geographical sciences, Prof. P. A. Moiseyev, doctor of biological sciences, L. A. Nikomarov, doctor of technical sciences, V. M. Nikl'shev, candidate of economic sciences, D. S. Pavlov, Russian Academy of Sciences academician, Prof. N. A. Pavin, doctor of biological sciences, Prof. L. S. Rass, doctor of biological sciences, V. V. Sapozhnikov, corresponding member, Russian Academy of Natural Sciences, O. A. Skarlato, academician, Russian Academy of Sciences, L. E. Spivakova, candidate of juridical sciences, S. A. Studem'skiy, corresponding member of Russian Academy of Agricultural Sciences, Prof. N. P. Sysyoyev, doctor of economic sciences, under the eyebrow head of "Open Letter": "We Only Have One Caspian", first paragraph is list of individuals to whom the letter is addressed]

[Text] To the president of the Azerbaijan republic, Mr. A. Elchibey, the president of the Islamic republic of Iran, Mr. A. A. Kh. Rafsanjani, the president of the Republic of Kazakhstan, Mr. N. A. Nazarbayev, the president of the Russian Federation, Mr. B. N. Yeltsin, the president of Turkmenistan, Mr. S. A. Niyazov.

Respected leaders of the Caspian States:

We, Russian scientists and specialists in the fields of ichthyology, ecology, fisheries, economics, and international relations, consider it our professional and civil duty to bring to your esteemed attention the catastrophic situation with regard to the fish in the Caspian basin and, above all, the principal wealth of that body of water—the sturgeon.

As we know, Caspian sturgeon—the Russian sturgeon, the great sturgeon [Beluga], the starred sturgeon [Sevruga], the sterlet, and the ship sturgeon—which spawn in the rivers that empty into the Caspian Sea and which feed all over that sea, provide 90 percent of the world's sturgeon catch. In essence, the Caspian and the rivers that empty into it contain the world's gene pool of sturgeon and remain the world's only storehouse of species diversity of those fish, which are among the most ancient on Earth.

The history of sturgeon catches and the latest scientific research show that to preserve those valuable species of

fish and to use them in a stable, sensible manner, we must take in only mature specimens, in strict compliance with scientific recommendations and exclusively in rivers during their spawning migrations.

In the past, in the first half of the twentieth century, when sturgeon fishing in the sea was under development and many young fish were being caught, the catches in the Caspian were only 5,000-6,000 tons.

Later, in 1962-1965 and up to 1991, marine fishing on most of the waters of the Caspian Sea was banned as a result of recommendations made by scientists, which led to a rise in the sturgeon population. There were limits placed on the fishing that was done during that time, only the lower courses of the spawning rivers were fished, the necessary quantities of mature fish were passed over for the sake of natural reproduction, some of the sturgeon were used for reproduction in 13 sturgeon hatcheries, and nearly 93 million young Russian sturgeon, starred sturgeon, and great sturgeon were released into the Caspian Sea every year as a result of pisciculture. Over the past five years, the release by hatcheries on the Volga River of young sturgeon has accounted for 58 percent of the Caspian great sturgeon stocks, 27 percent of the Russian sturgeon stocks, and almost 53 percent of the starred sturgeon stocks.

The development and implementation of that complex system of measures for regulating fishing and reproduction and for protecting or banning marine fishing were the result of the creative work of fishery scientists, specialists, and practitioners from all the Caspian republics, which made it possible to have stable sturgeon catches of 22,000-27,000 tons in the late 1970's and in the 1980's.

In recent years, however, as a result of the breakup of the Soviet Union, sound rules for fishing have not been observed, and the unified fish-protection agencies have broken up, and, as a result, the violations associated with sturgeon fishing have become massive. The fact that the ecosystem of the Caspian basin is all one system is being completely ignored, with the reproduction of sturgeon—including hatchery reproduction and raising—taking place primarily in the rivers that empty in to the northern Caspian, and the feeding period taking place in the sea, with a definite cycle of migration along the shores of all the Caspian states. In connection with that, a system for providing the Caspian states with sturgeon catches via river fishing has been developed, with the size of the takes based on the contribution made by those states to the reproduction of the fish and on the level of their restraint in terms of marine fishing. Thus, the fishermen of each state can also get their legal share of the sturgeon takes in the future, too. Despite all that, the sturgeon continue to be destroyed rapaciously and

uncontrollably right in the sea, and as early as 1992, the takes of those valuable fish amounted to only 8,000 tons, that is, they dropped threefold in a short period. In such conditions, the number of mature fish that make it to the spawning rivers has dropped, as a result of which the yield of natural reproduction has dropped. With the Russian sturgeon, for example, it has dropped fivefold. The number of mature great sturgeon migrating to the Volga River has dropped dramatically, and as a result, the hatcheries cannot produce the number of young of that species needed to maintain its population.

Scientists are predicting that if we don't stop the maritime fishing, the sturgeon population will decline even more.

What is also doing a great deal of harm to the sturgeon populations is the continuing pollution of the spawning rivers and of the Caspian Sea itself.

In light of the ecological features of the sturgeon, its species diversity, and the structure of its populations, we are convinced that, if the continuation of such unsound maritime use of their reserves, in conjunction with the pollution, is not stopped and reversed, those processes will, in a very short time, lead to an irreversible collapse of their population and to the total loss of those valuable fish for the peoples of the Caspian states.

Foreseeing all that, fishery scientists and practitioners and international-law specialists in 1992 prepared a draft agreement that is now being examined by the proper agencies of your countries. The draft Agreement on the Preservation and Use of Biological Resources of the Caspian Sea is, we are thoroughly convinced, mutually beneficial, nondiscriminatory, and, essentially, the only alternative for achieving consolidation of the efforts of all the Caspian states not only in terms of preserving the sturgeon population, but also in terms of increasing it and, consequently, creating a stable take of those valuable fish for the benefit of the interests of the indigenous population and the professional fishermen of the coastal regions of the Caspian Sea. Dragging out the signing and the implementation of this most important international document will go against common sense and against the spirit of the agenda adopted at Rio de Janeiro for the twenty-first century.

As a result, we ask that you, senior representatives of the people, focus your attention on preserving the sturgeon and that you exert your political will to achieve as quickly as possible the signing of the Agreements on the Preservation and Use of Biological Resources of the Caspian Sea.

There is no other way to save the sturgeon, which are a national treasure for the Caspian states, from total destruction.

Development of Biopesticides by Biopreparat

937C0209 Moscow ZASHCHITA RASTENIY
in Russian No 12, Dec 91, pp 3-6

[Interview by ZASHCHITA RASTENIY correspondent T. N. Fomenko with V. N. Davydov, general director of the Biopreparat firm of the USSR Ministry of the Medical Industry, and V. I. Usenko, section chief for biotechnology; first paragraph is source introduction; passages in italics as published]

[Text] *The state firm Biopreparat was organized out of the Biopreparat firm under the USSR Ministry of the Medical Industry. Its singular area of activity was the production of disposable syringes and systems for blood acceptance and transfusion, the design and manufacture of therapeutic, prophylactic, diagnostic drugs, medical instrumentation, antibiotics, nutritional supplements for livestock as well microbiological products for plant protection. Information about the consolidation of biopesticide development and production and problems and prospects of this field of endeavor is elicited by our correspondent T. N. Fomenko in his discussion with V. N. Davydov, the firm's general director and the chief of the biotechnology division V. I. Usenko.*

[Fomenko] Concerns are associations that have recently come into being in the economic life of our country. Although the number of such entities have been increasing in recent years and the term concern has become quite customary, I believe it would not be excessive to make clear, once again the purpose for which these structures are being organized.

[V. I. Usenko] One should first of all note that the organization of major industrial-economic complexes is currently needed to activate the consolidation and concentration of production, the denationalization of economic activity, and the acceleration of scientific-technological progress based on the flexible utilization of resources. At the present time our concern is an independent scientific-industrial complex that comprises a voluntary consolidation of scientific-industrial and industrial associations, enterprises, institutions, and organizations. In this connection, in contrast to previously existing administrative relationships, the basic principles governing the activity of our concern are emerging as cost accounting, self-financing, and self-management. Present and future planning are implemented on the basis of government placement of orders, national, republic, regional programs as well as plans independently developed by enterprises.

[Fomenko] As I understand it, the Biopreparat concern has taken upon itself the development, production, and sale of bacterial preparations to be used in our country for plant protection. How are the efforts of the concern enterprises being coordinated and how are those efforts being correlated with agricultural requirements?

[V. N. Davydov] We participate in various agricultural conferences, meetings, and seminars where plant protection problems are discussed and where we elucidate which problems are of the greatest concern to specialists. We always attend sessions of the State Chemistry Commission and are in close contact with the biological methods section of the State Agricultural Chemistry Association [Soyuzselkhozkhim]. That is, we discern agriculture's priorities, guide the scientific sector toward the development of needed preparations and guide the plants toward their manufacture.

[Fomenko] Which enterprises make up your concern?

[V. N. Davydov] At the present time the Stepnogorsk "Progress" plant and the Berd Biological Preparations Plant are producing plant protective substances. The "Progress" plant is producing products for agriculture only. In addition to plant protective substances (Lepidocide, bitoxibacillin, dendrobacillin, gameline) its product list also includes nutrient supplements and antibiotics for livestock. The Berd plant produces the same items so that, strictly speaking, there is no monopoly over the production of these preparations. There is even a certain competitiveness among these producers. In addition, the Berd plant manufactures plant growth hormones and medicinal products. The latter's output of biopreparations is less than that of the "Progress" plant. Frequently the manufacture of some items is not profitable for the Berd plant because of high production costs. Consumers feel that the price of the preparations is too high whereas the price is too low for the plant. The enterprise decided on a compromise by producing the preparations in small packages that are convenient for amateur gardeners.

[Fomenko] Please tell me about new preparations and which scientific institutions are involved in their manufacture?

[V. I. Usenko] The All-Union Scientific-Research Institute for Applied Microbiology is the principal institute engaged in plant protective substances. It has organized a specialized laboratory that coordinates and resolves tasks concerned with a whole range of problems. In addition, scientific research is being carried out at the All-Union Scientific-Research Institute for Molecular Biology (Novosibirsk), the All-Union Scientific-Research Institute for Highly Purified Biopreparations, and the All-Union Scientific-Research Institute for Applied Biochemistry (Moscow). As you can see, considerable scientific efforts have been put into action. Scientists have worked out a "target interdepartmental scientific-technological program for raising the efficiency of agricultural production and improving environmental quality by means of organizing regional ecologic biotechnological enterprises as well as the design and introduction ecologic biotechnical products into agricultural production." A splendid idea! Its rapid implementation would be highly desirable. However, the necessary funds are not available. The field of applied microbiology, as is, by the way, our entire scientific sector, is presently

undergoing a difficult period. One would think that a state concern would be able to resolve such an important state problem. But no! It alone is not able to allocate 30 million rubles annually for scientific-research and experimental pilot projects. That is the amount which experts believe is essential to the sector's maintenance. Yet, the Ministry of Agriculture is not able to invest a perceptible sum for these projects. Consequently, the program is being fulfilled only partially.

[V. N. Davydov] We are forced to divide our limited funds among those priority areas that represent vitally important areas of research. Moreover, centralized financing has been completely halted for this year. In recognition of this area's importance we are making use of plant profits obtained from the manufacture of disposable syringes, drugs, and various instruments. The concern's enterprises allocate a certain segment of their income to our centralized fund from which we finance scientific research, including research in the area of plant protection. In the current year that amount of money four is times less than what it was last year. We have been able to find only 2 million rubles. We are now financing the development of preparations against mildew, whiteflies, and root rot, i.e., those items that cannot be delayed. Scientists are designing the manufacturing process for these biological products, and later on we will decide where they should be produced.

[Fomenko] Two plants for the entire country is very little indeed, not to mention the fact that new processes must be mastered in order to produce the new biopreparations. Are any kind of enterprises being organized within the structure of the concern?

[V. N. Davydov] In the last five years we have not been able to start the construction of a single plant nor begin the reconstruction of existing plants. We have, however, been planning to build plants in Nizhnegorod and Kokchetav Oblasts and in the Mariysk Republic. But the construction recession of recent years in our country and the cessation of centralized capital investment have not afforded us the possibility to start the construction of such installations. We are therefore experiencing considerable difficulties in having our projects implemented.

[Fomenko] In your opinion to what extent has the domestic market for biopreparations been satisfied and what is their demand level?

[V. N. Davydov] We understand that the supplies of preparations are extremely insufficient to satisfy agricultural needs or to make them available wherever and whenever they may be needed. Nevertheless, requisitions in our country have not been closed, i.e., demand has been satisfied. At first glance, this may seem paradoxical! As of the present day we produce as much as is demanded of us. The output capacity of our plants is approximately 16 thousand tons of biopreparations annually.

[Fomenko] And what is the production volume this year?

[V. I. Usenko] More than 11 thousand tons have been preliminarily recorded, but after a further check on consumption in the regions, that figure was reduced to 6 thousand tons.

[Fomenko] Do you attribute that to the passivity of the agricultural sector and its reluctance to spend money?

[V. N. Davydov] More than likely this is due to the absence of funds. However, in my personal opinion, these are simply excuses. Many manufacturers compare the price of our preparations to chemical products even though any non-economist understands that their manufacturing process is different and the production cost of our products differs, hence the difference in our prices. But the first demand of managers is this: "If you lower your price, we'll buy your product." But we too cannot afford to work at a loss. Therefore the prices were adopted centrally and where to a certain degree acceptable to both managers and producers. But price is not the main thing. Consumers forget ecological problems take first precedence. The application of biological preparations must be advanced primarily because they do not cause environmental damage and preserve the biological purity of products. Surely this has been frequently rejected. And we have been frankly told this by agricultural workers: "We understand that your products are non-injurious and your prices are substantiated, but we also have our own plans. We cannot count on your preparations. They are slow to take effect, require a rather high level of technical application, precise measurement, and observance of processing times." We are not accustomed to work like that. The quality of agricultural production leaves much to be desired. It seems to me that this is the crux of the matter. This is my personal opinion: The most vulnerable link in the science-production-application chain is the last link. Because of the reluctance to use biopreparations, millions of rubles for biological funds have been written off. I remember that about three years ago biological preparations with expired dates of validity were written off to the tune of 10 million rubles. In meeting with agricultural workers I came to the conclusion that the main obstacle to the introduction of our preparations was not their price or even their preparative form, although those criticisms may have been justified, but to the fact that the agricultural workers did not know how to use them. After all, no one is seriously engaged in the training of specialists in bioprotection who know how to work with such exacting items as biological products. In any agricultural institution of higher learning a total of only 20 to 40 hours are given to biological protection. There is your answer to the question.

[Fomenko] Does your concern advertise your products?

[V. N. Davydov] To a great extent. During the last year two of our plants probably spent several tens of thousands of rubles. We advertised our products in all the oblast newspapers of Russia without exception and in some of those in the Ukraine. There was an extensive interview with the management of the "Progress" plant

on channel 2 of national television. Our specialists have spoken on the radio. Our plants have been constantly participating in the Moscow exposition-fairs where their products are advertised. Incidentally, they are now concluding direct negotiations there with oblast and republic organizations of the State Economic Trade Committee for the delivery of products.

[Fomenko] Vladimir Nikolaevich, our editors have been receiving articles and letters which apparently indicate that the agricultural demand for all biopreparations has not been satisfied. Many preparations which have already been approved for use are no longer being produced. This particularly relates to antibiotics such as phytolavin and phytobacteriomycin.

[V. N. Davydov] Well, those complaints have not been directed at our concern. The production of those agents was under the jurisdiction of the USSR Ministry of the Medical Industry. However, for the enlightenment of the readers I can offer one small correction. At first, the plant in the city of Ungena (Moldova) produced antibiotics for plant protection. Then production there was halted and construction was started on a plant in the city of Droghichin (Bretsk Oblast). However, as has been often the case lately, the public came out with the slogans: "We don't need these preparations, it is more important for us to gather mushrooms and berries!" The construction of this plant was not allowed and the enterprise was retooled to produce different products.

[Fomenko] And in general do the "greens" frequently come out to oppose the development of microbiology plants?

[V. N. Davydov] I have already mentioned that construction was begun on a plant in the Mariysk Republic which, in addition to plant protectives as its principal product, was supposed to produce vitamin C which we often purchase abroad with hard currency. The director of the local school put out a cordon of school children, declaring: "We don't need vitamin C, we shall eat our own apples and will get along without your vitamin." That's the kind of argument we get.

[Fomenko] What is your opinion. Do you think that similar fears of people and protests against the development of plants have some realistic foundation?

[V. N. Davydov] In general, one may of course halt the production of medicines, but surely not all persons can be cured with apples. Unfortunately, by falling into the trap of group egoism, any conclusions by state and even public experts to the effect that new plants would be ecologically safe are being swept aside in some regions.

[Fomenko] What do you see as the overall prospects for the production of plant protective products?

[V. N. Davydov] If we get the financing, that is all that will be necessary! Everything depends on funds: both scientific support and the construction of plants. Incidentally, there is considerable interest abroad in our products and many countries are ready to buy our preparations. Italy, for example, is interested in all of our biopreparations without exception and is ready to arrange for their preparative form. Americans have been comparing our preparations to their own with respect to activity and quality. Negotiations on joint production are under way. Nations prepared to buy our products include Brazil, Egypt, India, Pakistan, Thailand, Vietnam, and others. By the way, those countries are proposing prices that are considerably higher than those in our own country.

[Fomenko] Wouldn't this help to resolve your financial problems?

[V. N. Davydov] It is my conviction that we must find a solution to our problems within our country. First of all, I repeat, the question of centralized financing for our entire sector must be resolved by the state through a buyer of our products, such as "Selkhozkhim" or some other organization that might be interested in research and final products. In addition, we must have a goal-oriented training of specialists in the field of practical bioprotection. The institutes of the Academy of Agricultural Sciences must become more active in the technology of applying microbiological preparations. Now if these four problems were resolved, then the science-production-application chain would be strengthened and the development of this method would go forward. So far we are at a rather high level of development in the area of bioprotection (with respect to microbiological preparations, entomophages, pheromones) in comparison to other countries. However, if we fail to take any measures we will be behind them in a few years. That would not be desirable.

[Fomenko] Perhaps the concern should look for some sponsors?

[V. N. Davydov] Well, try to find one via a journal. But seriously, I believe that it is first the consumer's head that has to ache. Usually, after that, in any case, the buyer must find the funds and then buy what he needs or develop something with the use of his money, and then he consequently obtains what he ordered. In our case the buyer is the agricultural sector, but it is silent and proposes no money. So far we are finding funds on our own, and this is no small amount. But further on everything will collapse if some kind of measures are not taken.

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A Program for the Improvement of Diagnosis and Treatment of Oncohematological Diseases in Children in the Russian Federation and Kazakhstan

937C02104 Moscow *KLINICHESKAYA LABORATORNAYA DIAGNOSTIKA in Russian*
No 11-12, Dec '92 pp 43-47

[Article by K. H. Metzner and V. V. Menshikov, Moscow Bureau of the charitable organization CARE-Germany, International Charity and Health Fund, UDC 616.155.392-053.2.470]

[Text] The charitable organization CARE-Germany, which since December 1990 has been extending humanitarian assistance to the population of the various republics of the former USSR, at the request of the Charity and

Health Fund, and in cooperation with it, has undertaken the development of programs for the improvement of medical assistance, recognizing that an improvement in the conditions for the maintenance of the health of citizens is an urgent necessity. The largest program, and the one promising the greatest success, is associated with one of the tragic problems of clinical hematology, the childhood leukemias.

Acute leukemia is even today regarded as a practically incurable disease. And it is particularly hard for the physician when he is compelled to make such a diagnosis in a young child at the threshold of its life. Although the frequency of leukemia is relatively small (see Table), the high probability of a fatal outcome (90-95 percent), which unfortunately is the actuality in the majority of the hospitals of this country, makes acute leukemia one of the notable causes of childhood mortality.

Leukemia Morbidity on the Territory of the Former USSR Based on 1990 Data

Form of leukemia	Sex	Total cases of the diseases	Including children in age groups			Total
			0-4	5-9	10-14	
Acute lymphatic leukemia	M	2489	214	235	119	568
	F	2083	151	158	101	410
						(978)
Other lymphatic leukemias	M	2290	20	17	17	54
	F	1752	10	19	17	46
						(100)
Acute myelocytic leukemia	M	1086	37	36	37	110
	F	1049	27	26	29	82
						(192)
Other myelocytic leukemias	M	802	11	9	8	28
	F	857	4	2	10	16
						(44)
Other acute leukemias	M	1099	105	74	54	233
	F	1116	58	58	38	154
						(387)
Other leukemias	M	610	20	22	20	62
	F	535	20	13	9	42
						(104)
Total	M	8376	—	—	—	1055
	F	7392	—	—	—	550
	(15 768)					(1605)

Note: In parentheses, the number of illnesses in individuals of both sexes

The search for methods of radical cure of the acute leukemias has led to the development of methods based on the suppression of pathological hematopoiesis. This can be achieved using radiation therapy or chemotherapy. It is clear that such methods are associated with a high degree of risk and require high levels

of qualification, practical skills, and exceptional courage on the part of physicians, careful care for patients on the part of mid-level medical personnel, impeccable cleanliness in the hospital, and a reliable supply of diagnostic and treatment instrumentation and appropriate pharmaceuticals.

However, with all the difficulties of such an effort, it yields a positive effect in 75-80 percent of cases of acute locking-in children, as can be judged on the basis of the experience of German clinics.

The German charitable organization CARE Germany, (president K. Noidne), has offered to organize and equip hematological centers capable of implementing innovative methods of treatment of the acute leukemias in children, based at a number of regional hospitals in Russia and Kazakhstan.

Thus far, it has been the basis of the development of a program for the improvement of the diagnosis and treatment of oncohematological diseases in children in the majority of the USSR (Commonwealth of Independent States). In developing the program, a number of important steps have been accomplished: the choice of sites for the introduction of OHC; the determination of the needs of a region to be furnished with an OHC; the training of personnel for OHC; and the equipment of OHC with instruments, reagents, and the materials.

Taking into account dispersive of large institutions within oncohematology specialization in a number of capital cities: Moscow, Minsk, Kiev, as well as in Saint-Petersburg, the creation of a network of new medical institutions oncohematology centers, which undoubtedly possess modern treatment and diagnostic capacities in full measure in various regions of Russia from the Center and the Povolzh'ye to Siberia and the Far East, as well as in the Central Asian sphere of the CIS, was the only way.

In order to accomplish the first two objectives, a study group of experts consisting of oncohematologists from Germany and Moscow, a transfusion specialist from Germany, a physician organizer from Moscow, and the physician coordinator from the German side was recruited. About 30 pediatric hospitals and oncological dispensaries on the territory of the countries of the USSR, in which treatment of leukemia is carried out, were reviewed. The impressions of the German experts, based on their statements, constituted a motivation of a feeling of respect for the self-sacrifice of the physicians given the meager capacities of the hospitals and deterioration after becoming acquainted with the level of equipment of the hospitals with instrumentation and the sanitary state. The conclusions and suggestions of the experts came down to the following:

- 1) The equipment of the clinical departments and laboratories of the hospitals with medical instrumentation is inadequate. It is necessary to equip the departments and laboratories with modern equipment in accordance with the recommended list.

The following are recommended for the clinical laboratory and the reanimation division: automatic infusers, infusion pumps, control monitors (heart, respiration, temperature), instruments for monitoring arterial pressure, respirators, suction pumps, BABYlog, and

[illegible]

- The acute shortage of appropriate pharmaceuticals. It is necessary to make available to the centers pharmaceuticals in accordance with the BFM protocol sufficient for two years of operation. Efforts should be undertaken during this period to develop the production of these preparations by local pharmaceutical industry.

The conclusions and recommendations presented above have formed the basis of the joint program of CARE-Germany and the ICHF [International Charity and Health Fund] which has received the title "Antileukemia". The program has been approved by the ministries of Russia and Kazakhstan; its local divisions have been coordinated with the administration and health organs and institutions at the location of the selected treatment institutions. The board of CARE-Germany has allocated 40 million German marks for the implementation of the program. The program is being intensively implemented.

Twelve institutions have been established as bases for the deployment of category I and II centers, taking into account the limited experience of personnel and the state of the material base of the institutions.

The category I centers (60 beds each) are located in the Khabarovsk kray pediatric hospital, the hospital of the agricultural academy in Novosibirsk, the oblast pediatric clinical hospital No. 1 in Ekaterinburg, and the Kazakh Scientific Research Institute of Pediatrics in Alma-Ata.

The category II centers (40 beds each) have been organized in municipal pediatric hospital No. 1 of Vladivostok, the oblast oncological dispensaries in Omsk and Volgograd, the oblast pediatric hospitals in Voronezh, Rostov-na-Donu, Chelyabinsk, Novokuznetsk, and municipal pediatric hospital No. 3 in Karaganda.

Despite the relatively modest capacity of these centers, they will be able in a year to accept practically the majority of children newly ill with acute leukemia in Russia and Kazakhstan (Russia, 460 beds with 683 cases of acute leukemia in children per year; Kazakhstan, 100 beds with 102 illnesses, according to the data of 1990).

The introduction of the BFM methods in the Belarus Pediatric Hematological Center in 1991-1992 has made it possible to come close to the same cure levels of patients as in Germany, i.e., 70-80 percent.

It must be stipulated that the calculations cited relate only to leukemias and do not include those oncological diseases in children which require radiation or surgical treatment.

The directors of the institutions have organized the repair of the centers' facilities.

Twenty-four medical hematologists have undergone on-the-job-training in Germany. A seminar has been conducted for the transfusion specialists, with the participation of scientists from Russia, the United States, and Germany.

The instrumentation, materials, and pharmaceuticals have been purchased and prepared for shipment from Germany directly to the centers being organized; the shipment schedule has been coordinated with the degree of preparedness of the material base of the hospitals.

The equipment is being sent to the centers for use under the control of the Charity and Health Fund which, in accordance with the wish of CARE-Germany, will remain the owner of this medical technology and which has the right to send it to a different institution should it be used ineffectively.

The experience of both German and domestic institutions also reveals a number of problems whose solution is closely tied to the activity of the clinical diagnostic laboratories and hospitals where the OHC have been established. Above all it is necessary to ensure the performance by the laboratory of a wide range of investigations which will make it possible to sufficiently objectively evaluate the state of the internal milieu and the functioning of various organs; this may have decisive significance for decision-making by the physician.

A minimal list of laboratory investigations:

1. *Enzymes*: AsAT, AlAT, gamma-glutamyl transferase, alkaline phosphatase, glutamyl dehydrogenase, hydroxybutyrate dehydrogenase, lactate dehydrogenase (LDH), creatine kinase (CK), alpha-amylase, lipase.
2. *Substrates*: glucose, creatinine, urea, uric acid, total protein, protein electrophoresis, total bilirubin, direct bilirubin, iron, transferrin.
3. *Electrolytes*: sodium, potassium, calcium, chlorides.
4. *Assessment of thyroid function*: thyroxine (T₄), triiodothyronine (T₃).
5. *Immunology*: IgA, IgG, IgM.
6. *Hematology*: complete analysis (including smear and thrombocytes), reticulocytes.
7. *Blood coagulation*: prothrombin time (Quick's), partial prothrombin time.
8. *Urine*: sediment, glucose, creatinine, amylase.

The precise timely diagnosis of disease is the principal problem among these.

The successive treatment depends to a substantial degree on the earliest possible beginning of the intensive suppression of the growth of pathological cells. Therefore, reliable cytological diagnosis comes to the fore. Cases of erroneous diagnosis in sick children coming to German clinics from Russia with incorrect diagnoses [sic] have already inflicted considerable harm on these patients.

In our view, it is necessary, along with monitoring of the quality of biochemical analyses, to expand the use of

monitoring of cytological investigations by sending blood smears of patients with hematological pathology to the laboratories.

The problem of hematological stains, the equipping of laboratories with binocular microscopes, etc., requires energetic measures.

The second group of problems relates to the virological monitoring of stored blood used for transfusion. Not only AIDS, but hepatitis and cytomegalic disease as well, can be the result of the intensive transfusion of children with blood using the BFM technology, if the blood transfusion units do not achieve timely monitoring of donors and do not prevent hospital infection. The proper supply of diagnostic kits and instrumentation in the laboratories of the blood service for the appropriate methods of analysis is what is most important for the elimination of this danger.

The problem of the timely microbiological diagnosis of infectious complications induced by intrahospital infection, opportunistic flora, etc., may also become urgent. The most rapid establishment of the sensitivity of the microorganisms causing the complication to specific antibiotics is an urgent condition of the management of such patients.

Thus, the laboratory aspects of the introduction of the BMF methods require serious attention, since the successive treatment, the preservation of life, and the restoration of health of sick children depend to a significant degree on appropriate laboratory support.

It should be noted in conclusion that the creation of the OHC through the sacrifices of the citizens and organizations of the FRG is only the beginning of the solution of the problem of the acute leukemias in children in Russia and Kazakhstan.

The German humanitarian aid only provides the initial impetus. It is now clearly necessary in the outlying regions to look for means to support their activity, and this will require up to 1.3 million German marks per year for the acquisition of reagents, reagent kits, plastic packs for the collection of blood, and other expendable, as well as about 1.8 million FRG marks for the acquisition of pharmaceuticals. This problems seem insoluble in today's economic situation, however, whether 800 children in Russia and Kazakhstan, newly ill with leukemia, will live or will die each year will depend on their solution.

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Transfer of Union Establishments to Direction of Republic Ministry of Health

937C0224 Alma-Ata ZDRAVOOKHRANENIYE
KAZAKHSTANA in Russian No. 4, Apr 92, p. 57

[Decree of the board of the Ministry of Health, UDC 614.2(574)]

[Text] In accordance with Republic of Kazakhstan presidential edict No. 410 "Transfer of Union Government Enterprises to the Direction of the Kazakhstan SSR Government" and Cabinet of Ministers resolution No. 742 "Matters of the Reception of Government Enterprises and Organizations Previously Belonging to the Union, to the Direction of Agencies Under the Direction of the Government of Kazakhstan SSR," the college of the Ministry of Health has adopted the resolution:

1. Scientific research institutes in Alma-Ata: The branch of the All-Union Scientific Production Association "Stomatology," the Central-Asian Anti-Plague Institute, and the Institute for the Advanced Training of Physicians will accept the balance and upkeep of the Kazakhstan Ministry of Health.
2. The science center for regional dietary problems of the USSR Academy of Medical Sciences in accordance with the Republic of Kazakhstan Academy of Sciences will transfer to its balance and upkeep.
3. The medical service of the Kazakh Directorate of Civilian Aviation and the ambulance service of the Alma-Ata, Tselinaya, and Western Kazakhstan railroads will remain under the direction of the departments with the Kazakh Republic directorate of Civilian Aviation and the Kazakhstan Ministry of Transportation responsible for their upkeep.
4. Considering the fact that medical unit No. 1043 of the Chief Directorate of the USSR Ministry of Health in Stepnogorsk, Tselinograd Oblast has six medical units of its own that are located in Tselinograd, Kokchetav, and Turgay Oblasts, they will be financed by the local budget through Central Medical Unit 104 with the organized subordination to the Tselinograd Oblast Health Department. Medical Unit 44 in Makinka will be financed with the local budget.
5. Medical unit 22 at the Ulbinsk Metallurgical Factory Production Association of the Ministry of Atomic Energy and Industry, located in Ust-Kamenogorsk, will be maintained by the Ulbinsk Metallurgical Factory Production Association. The Eastern Kazakhstan Oblast Health Department will administer it.
6. Medical units Nos. 4 and 5, located in the villages of Mirnyy and Aksuyek, Moinkumskiy Rayon, Dzhambul Oblast, medical units Nos. 1 and 7, located in the villages of Stepnom and Taukent, Suzakskiy Rayon, Chimkent Oblast, the anti-plague station at the Yuzhpolimetall Production Association, medical unit 167 in Kurchatov, Semipalatinsk Oblast, and medical unit 102 in Aktau, Mangistau Oblast will be transferred to the oblast health departments and financed by the oblast budgets.
7. The anti-plague stations in Guryev, Kzyl-Orda, Mangistau, Taldy-Kurgan, Ural, and Chimkent Oblasts will be transferred to the Central-Asian Anti-Plague Institute and financed by the republic budget.
8. The pharmaceutical establishments belonging to the union will be transferred to the oblast Farmatsiya Production Associations.
9. In order to support a single state sanitation surveillance in the republic, the sanitation and epidemiology station of the Third Chief Directorate of the USSR Ministry of Health and the sanitation and epidemiology stations of the railroads will be transferred to the republic Ministry of Health and financed by oblast budgets.
10. The leaders of the oblast health departments are as follows: R. A. Sobolevaya—Eastern Kazakhstan, O. N. Doskulov—Dzhambul; B. T. Turarbekov—Mangistau; B. S. Slyambekov—Semipalatinsk; V. A. Maltsev—Tselinograd, and A. K. Kulmakhanov—Chimkent. They will adopt measures for controlling the prompt transfer and financing of the transferred establishments to the local budget of the Union health department establishments.
11. The chief of the Economic Directorate (S. N. Arystanov) will calculate the changes in the republic health department budget.
12. The college is giving responsibility for the execution of the resolution to first deputy minister V. I. Vyushkov.

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